



**GESTATIONAL DIABETES MELLITUS : PERSPECTIVE AND REDUCING BARRIERS**

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**ABSTRACT**

Gestational Diabetes is high blood sugar that develops during pregnancy and can cause problems for both mother and baby, during and after birth. But the risk of these problems can be reduced if its detected and well managed.

**Key words:**

Gestational Diabetes Ellitus, Perspective, Barriers.

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**INTRODUCTION**

Gestational Diabetes Mellitus (GDM) has been recognized as a complication of pregnancy that will resolve after child birth, but recent research has identified that this diagnosis may dignify a life time issues<sup>1</sup>. Women with GDM are at risk of developing type 2 diabetes (DM) after delivery, but many women have the misconception that health treat ends with delivery of the neonate<sup>2</sup>. Women with GDM and their offspring are at increased risk of both short and longer term complications including for mothers, later development of type 2 diabetes and metabolic syndrome<sup>3-7</sup>. The adverse intrauterine change in the fetus that may contribute to metabolic disorders the so called vicious cycle of diabetes<sup>8</sup>. The mainstay of GDM treatment is dietary and lifestyle modifications which includes medical nutrition therapy, weight management, and physical activity<sup>9</sup>.

**Prevalence**

GDM is the most common medical disorder of pregnancy and affects approximately 4% to 10% of pregnant women in the United State each year (ADA 2010). Women with a history of GDM have 35-60% chance of developing type two diabetes (CDC 2011). According to CDC (2011), 5-10 percent of women with GDM are diagnosed with DM immediately after pregnancy or during post partum period.

**Risk Factors**

It is likely that interaction between risk factors rather than any single risk factor, dispose woman to gestational diabetes.

**Summary of risk factor with gestational diabetes.**

- Increasing maternal age (>40 years)
- Family history of diabetes in first degree relative
- High risk ethnic group (Indo-Asia, Pacific Peoples, Middle Eastern)
- Elevated body mass index  $\geq 27$  Kg/m<sup>2</sup> in Indo-Asian,  $\geq 30$  Kg/m<sup>2</sup> in other ethnicities.
- Previous macrosomic infant (>4000gm)
- Previous history of gestational diabetes mellitus
- Previous history of impaired fasting glucose or impaired glucose tolerance
- Women with Polycystic Ovary Syndrome
- Known Cardiovascular disease, persistent hypertension (>135/80 mmHg), elevated triglycerides / cholesterol.
- Advancing age  $\geq 35$  years for indo Asian & Pacific peoples,
- $\geq 45$  years for other ethnicities
- Long term use of steroids / antipsycholic medication \
- Physical inactivity / sedentary life style

Some women with no known risk factors may still be diagnosed with gestational diabetes. Risk factors survey would fail to identify these women. For women with probable undiagnosed diabetes, the risk of adverse outcome for mother and fetus from waiting until 24-28 weeks gestation for gestational diabetes and identification of women with diabetes early in pregnancy allows preventive measures to be commenced earliest.

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## Screening

### Oral Glucose Challenge Test

The studies assessed a one hour 50g oral glucose challenge test, gestational diabetes was confirmed the American diabetes association. One Canadian study confirmed diagnosis using Canadian Diabetes Association 75gm, two hour criteria<sup>10</sup>. There studies assessed 50g oral glucose challenge test ( $\geq 7.8$  mmol/L) with gestational diabetes confirmed using the world health organization 75gm criteria<sup>10</sup>.

### Fasting Plasma Glucose

Seven studies assessed fasting plasma glucoses to screen for gestational diabetes which was confirmed using Carper and Coustan Criteria. Screening protocols together with appropriate management subsequently can affect health outcome and ideally should be evaluated with randomized control trials. Screening recommendations vary widely and most are based on consensus statements. A study of 296 women concluded that HbA1c was useful to optimize the timing of screening for gestational diabetes allowing for treatment at any earlier stage of pregnancy but that this finding needs confirmation by larger studies<sup>11</sup>. It is important to distinguish HbA1c testing in early pregnancy ( $< 20$  weeks) and testing between 24 and 28 weeks to identify gestational diabetes. HbA1c measurements later in pregnancy do not adequately separate women with normal pregnancy from those with gestational diabetes as HbA1c levels decline during pregnancy<sup>12</sup>.

### Prevention of Gestational Diabetes Mellitus

Its scope included dietary counseling, exercise programmes and programmes that combine dietary, exercise and educational intervention.

### Dietary Intervention

Two systemic reviews of dietary intervention were identified which together covered seven randomized controlled trials and 813 women. Systemic review evidence advises reducing energy intake or weight gain. Dietary counseling is more effective than usual care in reducing the risk of gestational diabetes<sup>13</sup>. A systemic review identified three trials (n=127 women) of high versus low glycemic index diet. In all studies, the participants started the dietary intervention in the first half of their pregnancy and continued until 36 weeks gestation. A low glycemic index diet is more effective than a high glycemic index diet in reducing the risk of having a large for gestational age infant<sup>14</sup>.

### Excercise Intervention

A single centre randomized controlled trial (n=510 women) recruited sedentary women with an uncomplicated singleton pregnancy who were not at a risk for preterm birth. A moderate intensity training programme consisting of 3 days per week in session of 50-55 minutes each from weeks 10-12 of pregnancy through to (38-39 weeks) was compared with usual care including general advice about the benefits of exercise during pregnancy, the intervention did not reduce the risk of developing gestational diabetes<sup>15</sup>.

## Combined Diet & Lifestyle Intervention

A multicentre cluster randomized controlled trial of a combined dietary and exercise intervention was identified. The participants of the trial (n=399 women) had a normal blood glucose level at 8-12 weeks gestation but at least one risk factor for gestational diabetes. The trial found a significant reduction in the increase of gestational diabetes 6% versus 29% of respectively, (p=0.04). The proportion of large for gestational age infants was lower in the intervention than in the usual care group 12.1% versus 19.7% respectively p = 0.042<sup>16</sup>.

### Treatment

Treatment strategies includes daily blood sugar monitoring, healthy diet, exercise and monitoring the baby. If blood sugar is too high, medication is required.

### Healthy Diet

Diet that provides essential nutrients and adequate calories. Avoid excess sugar, carbohydrate and fatty foods.

### Physical Excercise

Aerobic activity for 20-30 minutes 5 days a week improve cardiovascular health.

### Antidiabetic Medication

Helps to control amount of sugar in blood. Use of oral hypoglycemic agents to treat gestational diabetes has not been recommended, because of concern about potential teratogenicity. Recent invitro and invivo evidence has determined that glyburide (micronase) does not enter fetal circulation.

### Insulin

Most but not all prospective trials involving insulin therapy in women with gestational diabetes have shown reduction in the incidence of neonatal macrosomia therefore insulin therapy traditionally has been started when capillary blood glucose level exceed 105 mg/dl in fasting state and 120mg/dl two hours after meals

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#### Key points :

- Avoid excessive weight gain in pregnancy
  - Energy intake should be no less than 1800 kcal/day and should include a distribution of macronutrient
  - Have smaller, more frequent nutrient dense meals.
  - Develop individualized meal plan with a dietician incorporating lifestyle and calculated factors
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## Management

### Mode of Birth for Women with Gestational Diabetes

Three systemic review identified one randomized trial with insulin dependent gestational diabetes were randomized to induction of labour or expectant management at 38 weeks gestation<sup>17</sup>.

### Timing of Birth for Women with Gestational Diabetes

The evidence recommended delivery before 40 weeks or recommends that as long as there has been good glycemic control during pregnancy and there are no known obstetric complication, the pregnancy should be allowed to continue to 40 weeks without induction of labour or elective caesarean section.

## Immediate Postpartum Care for Women and Infants

### Breast Feeding Initiation

Early breast feeding (Within 30 minutes after birth) could facilitate glycemic control in infants whose mothers had gestational diabetes. There was significantly lower rate of borderline hypoglycemia compared with infants who were not breast feed in early postnatal period or those who received formula as their first feed<sup>18</sup>.

### Monitoring of Neonatal Blood Glucose Levels Postpartum

It is recommended that monitoring of neonatal blood glucose should continue for about 12-24 hours until three consecutive preferred ready >2.6mmol/L are made.

### Monitoring of Maternal Blood Glucose level Postpartum

It should be checked before and two hours after meal for 24 hours after delivery.

### Diabetes Medication

Evidence suggest that diabetic medication (oral hypoglycemic and insulin) should stop immediately after delivery and should not be recommended without referral to medical or diabetic team.

### Maternal Diet

It is recommended that the women could return to a normal diet after delivery.

### Barriers

#### Inadequate knowledge

The greatest barriers to proper GDM control is inadequate knowledge about disease pathophysiology, ways to control GDM and possible adverse outcomes for mother and foetus. Studies shows that it is necessary to emphasize the importance of preventing adverse outcomes of uncontrolled GDM and possible adverse outcomes for mother and foetus<sup>19</sup>.

#### Non-Compliance with Treatment

It is necessary to provide mothers with gestational diabetes a clear cut management of GDM. Provide information about each prescribed medication, including mechanism of action, dosage, schedules and possible side effects. Assess the patient's ability to calculate insulin dose and determine how many daily carbohydrate she can consume<sup>20</sup>.

#### Financial Constraints

For low overcome common limited finance are a major obstacle to both diabetes treatment, adherence and regular prenatal care. Low income women typically can obtain health insurance from local, state or national health programmes.

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